

<110> Hahn, Beatrice  
Gao, Feng  
Shaw, George

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SEQ 14

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SEQ 16

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<210> 12

<211> 1479

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=gag

<400> 12

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SEQ 34

f

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 <211> 579  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=93BR020; gene=vif

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 <211> 291  
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 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=93BR020; gene=vpr

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ataaggatata	tgcaacaact	actgtttatc	catttcagaa	ttgggtgccg	tcatagcaga	240
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<210> 15  
 <211> 2610  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=93BR020; gene=tat

f

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gtcaaatatt tttagcaatag gcatagcagc attaatagta gcactaataa taacaatagt 300  
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<210> 16  
<211> 2661  
<212> DNA  
<213> Human immunodeficiency virus type 1

<220>  
<223> isolate=93BR020; gene=rev

SEQ 36

f

<400> 16

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ggcatagcag	cattaatagtg	agcactaata	ataacaatag	tgtgtgtggac	tatagcatat	180
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<210> 17  
 <211> 246  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>

SEQ 37

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<223> isolate=93BR020; gene=vpu

<400> 17

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<210> 18

<211> 2541

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=env

<400> 18

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SEQ 38

f

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<210> 19

<211> 27

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=nef

<400> 19

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27

<210> 20

<211> 8

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR020; gene=gag-pol fusion

<400> 20

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8

<210> 21

<211> 207

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=gag

<400> 21

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<210> 22

<211> 2739

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=pol; note=NH2-terminus  
 uncertain

<400> 22

SEQ 39

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<210> 23

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=vif

SEQ 40

f



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 agacatcagct atgaaagcag gcatccaaga gtaagttcag aagtacacat cccactaaga 180  
 gatgctacac tagtagtaag aacatatttg ggtctgcatg caggagaaaa agactggcaa 240  
 ttggggccatg ggggtttccat agaattggagg cagaaaagat atagtacaca aatagaccct 300  
 aacacagcag accatctgat tcatctgtat tattttgact gtttttcaga atctgcata 360  
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 aaggtaggat ctctacaata tctggcatcg aaagcattag taaccaccaac aaggaaaagg 480  
 ccacctttgc caagtgttgg gaaattagca gaagatagat ggaacaagcc ccagaagacc 540  
 agggaccaca gagagaaccc tacaatgaat ggacattag 579

<210> 24

<211> 291

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=vpr

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 ggcttaggac agtatatcta taacacttat ggggatactt gggagaggat tgaagccata 180  
 ataagaatac tacaacaact actgtttatc catttcagaa tcgggtgccca acatagcaga 240  
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<210> 25

<211> 2597

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=tat

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 aaagggttag gcatctccta tggcagggaag aagcggagac cccgacgagg aactcctcag 180  
 ggagtaagg atcatcaaaa cctgtacca aagcagtaag tagtaacaat taatatatgt 240  
 aatgcaggcc ttgaaaaatat ctgactaata gtagcattca tagcagccac aattgtgttg 300  
 agtatagtat ttatagaata tagaaaaata agaaaacaga aaaaaataga aaagttaact 360  
 gatagaataa gagaaagagc agaagacagt ggaatgaga gtgaaggaga tacagaggaa 420  
 ttggcaaac ttatggaat gggggacttt gatccttggg ttggtaataa ttgttagtgc 480  
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SEQ 41

f

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aatattccata	atgatatgtag	gaggtttaat	aggtttaaga	atagtttttg	ctgtgctttc	2460
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ccagcgggaa	cccgacaggc	tcggaaaaac	cgaagaagga	gggtggcagc	aagacagaga	2580
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<210> 26

<211> 2663

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=rev

<400> 26

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tctgactaat	agtagcattc	atagcagcca	caattgtgtg	gagtagatga	tttatagaaat	180
atagaaaaat	aagaaaaacg	aaaaaaatag	aaaagttact	tgatagaata	agagaaagag	240
cagaagacag	tggaaaatgag	agtgaagggg	atacagagga	attggcaaca	cttatggaaa	300
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agaataaaca	tggtagaaca	gatgcaggag	gatataatca	gtttatggga	ggaaagccta	600
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tgctgtccag	ctggcttttgc	gatttttaag	tgtagggata	aggagtacaa	tggaaacagga	960
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SEQ 42

f

caactactgtc	tgaatggcag	tttagcagaa	gaagatataa	gaattagatc	tgaaaatttc	1080
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<210> 27

<211> 26

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=vpu (defective); note=10 bp deletion early in vpu frameshifts, results in premature termination

<400> 27

tgcaggcctt agaaatatct gactaa

26

<210> 28

<211> 2550

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=env

<400> 28

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ctgggtgttg	taataatttg	tagtgcctca	gataacttgt	gggtcacagt	ctattatggg	120
gtacctgtgt	gggaagatgc	agataccccc	ctattctgtg	cctctgatgc	taaatcatat	180

SEQ 43

f

agttctgaaa	aacataatgt	ctgggtctaca	catgcctgtg	tacccacaga	ccctaaccga	240
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gaacagatgc	aggagatat	aatcagttta	tgggaggaaa	gcctaaagcc	atgtgttaag	360
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<210> 29  
 <211> 1503  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=90CR056; gene=gag; CDS:  
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 ctggaagaat ttgcacttaa ccccgccctt ttgaaacac cagaaggctg tctacagata 180

SEQ 44

f

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agtaccctcg	aggaacaat	agcatggatg	acaggcaatc	cagctatccc	agtggggagac	780
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gcagagagct	tcgggttcg	agaggagatg	acccctctc	cgaagcagga	gcagctgaag	1440
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<210> 30

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=vif

<400> 30

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agacatcatt	ttgaaagcac	tcattccaagg	ataagttcag	aagtacacat	ccatttagga	180
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ttaggccagg	gagtcctccat	agaatggaga	ctgaaaaggt	atagcacaca	agtagagcct	300
ggcctggcag	accaactaat	tcattatgcat	tattttgatt	gtttttcaga	atctgccata	360
aggaaagcca	tattaggacg	tgtagttaga	cctaggtgta	actatccagc	aggacataaa	420
caggttagaa	ctctacaata	cttggcatta	acagcattag	tggcaccaaa	aaagataaag	480
ccacctttgc	ctagtgttag	aaagctagta	gaggatagat	ggaacaagcc	ccagaagacc	540
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<210> 31

<211> 291

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=vpv

<400> 31

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SEQ 45

f

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 ataagaacgc tgcacaacct actgtttatt catttcagaa ttgggtgcc aatagcaga 240  
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<210> 32

<211> 624

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG083; gene=nef

<400> 32

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 ggagcaatca caagcagcaa tacagcaacc aacaatcctg attgtgcctg gctggaagca 180  
 caagaggagg actcagatgt aggccttccg gtcagaccac aggtaccttt gagaccaatg 240  
 acttataagg ctgcttttga tctcagcttc tttttaaagg aaaagggggg actggatggg 300  
 ctaatttact ccaagagaag acaagacatc ctgtatctat ggggtctataa tacacaagga 360  
 ttcttccccc attggcagaa ctacacacca gggccaggga ctagactccc actgaccttt 420  
 ggggtgtgct tcaaatcagt accaatggac ccagcagaga tagaggaagc caataaggga 480  
 gagaacatca gtctattaca ccccatctgc cagcatggaa tggaggatga agacagagaa 540  
 gtgctggatg ggagatttaa cagtgccta gcacggagac acctagcccc agagctgcac 600  
 ccggagtact acaagagctg ctga 624

<210> 33

<211> 2606

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=tat; CDS: join (5177..5391,  
 7698..7782)

<400> 33

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 agtttgcagg atcatcaaaa ttctatatca aagcagtaag tattatcata aatgtatata 240  
 ttaggattag gaataggagc gctagtagta acattttatca tagccgtaat tgtgtggacc 300  
 atagtatata tagaataata aaaattggta aggcaaaaga aaatagacag gctaattgaa 360  
 agaataggag aaagagcaga agacagtggc aacgagagtg atggagacac agaggaatta 420  
 tccaagctta tggagatggg gcaccttaat cttgggtatg ttgctgatct gtagtgctgc 480  
 acaaaacttg tgggttacag tatattatgg ggtacctgtg tggaaagagg caaaaaccac 540  
 tctattctct gctatcagatg ctaaggcata tgagacagaa aagcataatg tctgggtcac 600  
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 gagctttaat atgtgggaaa ataacatggg ggagcagatg catcacagca taatcagttt 720  
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 aaattgtaat accctcagta ttacacaggc ttgcccaag gtgtcctttg aacctattcc 1020  
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SEQ 46

f

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<210> 34

<211> 2657

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=90CR056; gene=rev; CDS: join(5316..5391,  
7698..7972)

<400> 34

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aaaaattggt	aggcaaaaag	aaaatagaca	ggctaattga	aaagaattaga	gaaagacgac	240
aagacagtgg	caacgagagt	gatggagaca	cagaggaatt	atccaagctt	atggagattg	300
ggcaccttaa	tcttgggtat	gttgcgtatc	tgtagtctgt	caaaaaactt	gtgggtttaca	360
gtatattatg	gggtacctgt	gtggaaagag	gcaaaaacca	ctctattctg	tgcatacagt	420
gctaaggcat	atgagacaga	aaagcataat	gtctgggcta	catatgcatg	tgtaccacca	480
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ccatgtgtaa	aattaacccc	actctgtgtt	actctaaact	gtactaatgt	cagaacaacat	660
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SEQ 47

f

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caggaaactaa	agaatag					2657

<210> 35  
 <211> 243  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
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ctaattgaaa	gaataggaga aagagcagaa gacagtggga acgagagtga tggagacaca 180
gaggaattat	ccaagcttat ggagatgggg caccctaatc ttgggtatgt tgetgatctg 240
tag	
	243

<210> 36  
 <211> 2538  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=90CR056; gene=env

<400> 36	
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SEQ 48

f



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tggaaagagg	caaaaaccac	tctattctgt	gcatacagat	ctaaggcata	tgagacagaa	180
aagcataatg	tctgggctac	acatgcagtg	gtaccacag	accccaaccc	acaagagatg	240
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<210> 37  
 <211> 621  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=90CR056; gene=nef

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SEQ 49

f

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<210> 38
<211> 1486
<212> DNA
<213> Human immunodeficiency virus type 1

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<220>
<223> isolate=92RW009; gene=gag

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gctggaagaa tttgcactta accctgacct tttagagaca ccagaaggct gtaacacaaat 180
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1486

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<210> 39
<211> 579
<212> DNA
<213> Human immunodeficiency virus type 1

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<220>
<223> isolate=92RW009; gene=vif

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<400> 39

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f

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gaagctagat	tagtaataaa	aacatattgg	ggtttgcaaa	cagggggaag	agattggcat	240
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aaggtagagat	ctctacaata	cttggcactg	acagcattga	taaaacccaaa	aaagataaag	480
ccacctctgc	ctagtgttag	taaattagta	gaggataaat	ggaacaagcc	ccagaagacc	540
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<210> 40  
 <211> 291  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=92RW009; gene=vpr

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ccccaggccg	cagagggaac
gtcagacact	ttcttagacc
ggggatactt	ggaggggagt
cttttcagaa	ttgggtgcgg
aatggagcca	gtatagctcta
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atggctccat	
agaagctata	
gcatagcaga	
a	

<210> 41  
 <211> 2640  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=92RW009; gene=tat

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agttgtgtgg	acttttagcag
taggttaatt	aagaaaaataa
cattgatgaa	tatcaaaaac
tttgtagtgc	tgcaaaacaac
acgcagagac	caccttattt
atgtctgggc	tacacatgcc
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acagtagtca	taactcagtat
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<210> 42

<211> 2658

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=rev

<400> 42

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caagccagta	gtatcaactc	agctgctgtt	aaatggcagt	ctagcagaga	aagagataat	1080
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SEQ 52

f

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<210> 43

<211> 246

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=vpu

<400> 43

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agggttaatta	agaaaaataag	agaaagagca	gaagatagtg	gcaatgagag	tgatggggac	180
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<210> 44

<211> 2583

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=env

<400> 44

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gtacctgtgt	ggaaagacgc	agagaccacc	ttattttgtg	catcagatgc	taaagcatat	180

SEQ 53

f

gattccagaaa	agcataatgt	ctgggctaca	catgcctgtg	tacccataga	ccccgaccca	240
caagaaatac	atttggaaaa	tgtgcacaga	gagtttaaca	tgtggaaaaa	taacatggta	300
gagcagatgc	atagacatat	aatcagttct	tgggacccaa	gcctaaagcc	atgtgtaaag	360
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taa						2583

<210> 45

<211> 624

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; gene=nef

<400> 45

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ggggcactta	caagtagcaa	cacaccagc	aacaatgctg	attgtgcctg	gctggcagca	180

SEQ 54

f

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caagaggagg aaaaagaagt aggcctttcca gtcagacctc aggtgccttt aagaccaatg 240
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caggacaact gcttactaca ccctctgagc cagcatggaa tggaggatga ggacagagaa 540
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<210> 46

<211> 8

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92RW009; standard name=3' LTR repeat  
region; note=3' R repeat should end one base  
beyond end of this

<400> 46

aaaaaaaa

8

<210> 47

<211> 1494

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG003; gene=gag

<400> 47

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ctggagagat ttgcacttaa ccctgacctc ttagaaacaa cagaaggttg tcagcaataa 180
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ggacatcaaa tgaagactg cacagagaga caggctaatt ttttagggaa aatttggcct 1320
tccaacaagg ggaggccagg gaattttctt cagaacaggc cagagccaac agccccacc 1380

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SEQ 55

f

gcagagagct tcgggttcgg agaggagata gccctctccc tgaagcagga gccgagggaa 1440  
aaggaatcac ctccattaac ctccctcaaa tcactctttg gcaacgaccc ctgag 1494

<210> 48  
<211> 4307  
<212> DNA  
<213> Human immunodeficiency virus type 1

<220>  
<223> isolate=92NG003; gene=gag-pol fusion

<400> 48  
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<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

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caggttaggat	cactacaata	ttagcactc	aaagcattag	taacaccaac	acagacaaag	480
ccacttttct	caggttttaa	gaagtttaaca	gaagatagat	ggaacgagcc	ccagaagacc	540
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<211> 114

<212> DNA

SEQ 57

f

<213> Human immunodeficiency virus type 1

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<223> isolate=92NG003; gene=vpr

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<211> 2579

<212> DNA

<213> Human immunodeficiency virus type 1

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<223> isolate=92NG003; gene=tat

<400> 51

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SEQ 58



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<211> 230

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=92NG003; gene=vpu

<400> 53

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<210> 54

<211> 2538

<212> DNA

<213> Human immunodeficiency virus type 1

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<223> isolate=92NG003; gene=env

<400> 54

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SEQ 60

f

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 <213> Human immunodeficiency virus type 1

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gcaatcacaa	cgagcaaat agcacaaact aatcctgatt gtgcctggct agaagcacaa 180
cgaggagaatt	cagaggttagc ctttccagtc agacaaacagg tacctttgag accaatgact 240
tataaggctg	cctttgatct cagcttcttt ttaaaagaaa aggggggact ggaatgggcta 300
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ttcccgagatt	ggcagaacta cactccaggg ccagggacta gattccccact gacatttcgg 420
tggtgcttca	aactagtacc aatggatcca gcagagatag aggaagccaa taaaggagag 480
aaacaacagt	tattacaccc tatctgccaa catggcctgg aagatcgga cagagaagtg 540
ctgttatgga	gatttgacag tagcctagca cggagacaca tagcccgaga acaaatccg 600
gagtactata	aggactgctg a 621

<210> 56  
 <211> 1438  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=93BR029; gene=gag

<400> 56	
atgggtgcga	gagcgtcagt aataagcggg ggagaattag ataatggga aaaaattagg 60
ttaaggccag	gaggacataa aaaatataga ttaaacata tagtatgggc aagcagggga 120

SEQ 61



gctagaacga	ttcgcagtta	atcctggcct	tttagagaca	tcagaaggct	gtagacaaat	180
actggaaacg	ctacaaccag	cccttaagac	gggatcagaa	gaacttagat	cattatataa	240
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gagaaggctt	ttagcccaga	agtaataccc	atgttttcag	cattatcaga	aggagccacc	540
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ttaaaagaaa	ccatcaatga	ggaagctgca	gaatgggaca	gagtagatcc	agtgcatgca	660
ggacctatcc	caccaggcca	gatgagggaa	cctaggggaa	gtgatataga	tggaactact	720
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cacaagggaa	ggccagggaa	tttccttcag	agcagaccag	agccaaacgc	cccaccagca	1380
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<210> 57

<211> 3012

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=pol; note=NH2-terminus  
uncertain

<400> 57

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gataccggag	cagatgatac	agtattagaa	gaaataaatt	taccaggaag	atggaaccca	300
aaaatgatag	ggggaattgg	aggtttttatc	aaagtaagac	agtatgatca	aataaccata	360
gaaattttgt	gacgtaaaag	tacaggtaca	gtattagtag	gacctacacc	gtcaacata	420
attggaagaa	atctgttgac	tcagattggc	tgcacttttaa	attttcccatt	tagtccattt	480
gaaactgtac	cagtaaaatt	gaagccagga	atggatggcc	caagggttaa	acaatggcca	540
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aaagatagta	ctaaattggag	aaaatttagta	gatttcagag	aacttaataa	gagaactcaa	720
gacttctggg	aggttcagtt	agggatacca	catcccgcag	ggttaaagaa	gaaaaataca	780
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SEQ 62

f

tgggcaagtc	agatttatgc	agggattaaa	gtaaggcaat	tatgtaaact	ccttagggga	1320
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tataaaaaatt	tgaaaacagtg	aaagtatgca	aggatgaggg	gtgcccacac	taatgatgta	1560
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attcctaatt	ttaaaactacc	catacaaaaa	gaaacgtggg	aagcatgggtg	gatagagtat	1680
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gctaataagg	aaactaaatt	aggaaaagca	ggatatgtga	ctgcagagagg	aagacaaaaa	1860
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attcaagcac	aaccagataa	gagtgaaata	gaaatagcca	atcaaatat	agagcagtta	2040
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gaacaagtga	acaaattagt	cagttctgga	atcaggaaag	tactattttt	agatgggaata	2160
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gaagggggcag	tagtaataca	agataatagt	gacataaaa	tagtgccaa	aagaaaagta	2940
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<210> 58

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=vif

<400> 58

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agacatcact	ttgaaagcag	gcattccaaga	gtaagttcag	aagtacatat	cccactagag	180
gaagctaaat	tagtaataaac	aacatattgg	gggtctgcata	caggagaaaag	agattggcat	240
ctgggtcagg	gagttctccat	agaatggagg	cagggggagg	ataggacaca	aatagaccct	300
ggcctggcag	accaactgat	ccatatatat	tatttttgatt	gtttttcaga	atctgccata	360
aggaaagcca	tattaggaca	tagaatttagc	cctaggtgtg	attatcaagc	aggacataac	420
aaggttaggt	ctctacagta	cttggcacta	acagcattaa	taaaacccaa	aaagagaaag	480
ccacctttgc	ccagttgtta	gaaactgaca	gaggtatagat	ggaaacaagcc	ccagaagacc	540
aaggaccaca	gaggggagcca	tacaatgaat	ggacactag			579

<210> 59

<211> 291

<212> DNA

f

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=vpr

<400> 59

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gaacttttag aggaacttaa gagtgaagct gttagacatt ttcttaggtt atggctccat 120
agcttaggac aacatatcta tgaactttat ggggatactt gggcaggagt ggaagccata 180
ataagaattc tgcaacaact gctgtttatt catttcagaa ttggatgtca acatagcaga 240
ataggcatta atcgacagag gagagcaagg aatggagcca gtatgcctta g 291
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<210> 60

<211> 2601

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=tat

<400> 60

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aagggcttag gcatctccta tggcaggaag aagcggagac agcgacacag aactcctcaa 180
agcagtcagc tacatcaaga tcctgtacca aagcagtaag tattgttaag taatatatgt 240
aatgtccatg ttgttagtaa taggttttagc agcattaata gcagcactaa taatagcaat 300
agttgtgtgg acctatgcat atatagaata tagggaaacta gtaaggcaaa gaaaaataaa 360
taggtttatat aaaagaataa gaaaaagagc agaagacagt ggcaatgaga gtgaggggga 420
tgcagaggaa ttggcagcac ttggggaaat ggggcctttt attcctgggg atattgataa 480
tctgtaatgc tgaaaaacttg tgggtcacag tctattatgg ggtacctgtg tggaaaagaag 540
caaccactac tttattctgt gcatcagatg ctaaaagcata tgaaaaagaa gcacataatg 600
tctgggtcac acatgcctgt gtaccacag atcccaatcc acaagaagta gttctggaaa 660
atgtaacaga aaattttgat atgtggaaaa ataactggt agaacaaatg catcacagata 720
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gaagtgaat atataaatat aaagtagtag aaattgagcc attaggagta gcaccacca 1860
agggcaaaaag acaagtgtgtg aagagagaaa aaagagcagt gggaatggga gctttgttcc 1920
ttgggttctt gggagcagca ggaagcacta tgggcgcagc gtcaataacg ctgacggcac 1980
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SEQ 64



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agggcagaca attattgtct ggcatagtgc aacagcagaa taatttgcgt agggcatttg 2040
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tctctggctgt ggaagagata ctaaaaggatc aacagctcctc agggcttttgg ggcctgctctg 2160
gaaaactcat ctgcaccact gatgtgccct ggaactctag ttggagtaac aaatctcagg 2220
agaagactctg ggggaacatg acctggatgg agtgggaaaa agagattagc aattactcaa 2280
acgaaatata taggttaatt gaagagtgcg agaaccagca gaaaaagaat gaacaagaat 2340
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<210> 61
<211> 2652
<212> DNA
<213> Human immunodeficiency virus type 1

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<220>
<223> isolate=93BR029; gene=rev

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ataggttttag cagcattaat agcagcacta ataatagcaa tagttgtgtg gactatagca 180
tatatagaat atagggaaact agtaaggcaa agaaaaataa ataggttata taaagaata 240
agagaaagag cagaagacag tggcaatgag agtgaggggg atgcagagga attggcagca 300
cttggggaaa tggggccttt tattcctggg gatattgata atctgtaatg ctgaaaacct 360
gtgggtcaca gtctattatg ggttacctgt gtggaaaaga gcaaccacta ctttattctg 420
tgcatcagat gctaaagcat atgaaaaaga agcacataat gtctgggcta cacatgctgt 480
tgtaccaca gatcccaatc cacaagaagt agttctggaa aatgtaacag aaaattttga 540
tatgtggaaa aataacatgg tagaacaat gcatacagat ataactcagtt tatgggatca 600
aagcctgaag ccatgtgtga agttaacccc actctgtgtt actttacgtt ctagttaatgc 660
cactaccaac agtactcaaa acgacacccc gaaggaaagag ccagggggcaa tacaaaaact 720
ttctttcaat atgaccacag aagtaagaga taagcagctg aaagtacatg cactttttta 780
taggcttgat atagtaccaa tcagcaatga taatagtagc aatgataata gtacgagaga 840
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ggatccaatt cccatacatt attgtgtctc agctgggtat gcgattctaa agtgtaatga 960
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tgccatagt ccaacgcaga ataatttgcg gagggtctat gaagcgcaac agcatctggt 1920
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SEQ 65

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actaaagaat	ag					2652

<210> 62

<211> 2529

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=env

<400> 62

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gaagtgtctc	tggaataatg	aacagaaaaa	tttgatatgt	ggaaaaataa	catggtagaa	300
caaatgcata	cagatataat	cagtttatgg	gatcaaaagg	tgaagccatg	tgtagaagta	360
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agtaacaaat	ctcaggagaa	gatctggggg	aacatgacct	ggatggagtg	ggaaaaagag	1860
attagcaatt	actcaaacga	aatatatagg	ttaattgaag	agtcgcagaa	ccagcaggaa	1920

SEQ 66

aagaatgaac	aagaattatt	ggcattggac	aaatgggcaa	gtctgtggaa	ttggtttgac	1980
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ttgctataa						2529

<210> 63

<211> 621

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=93BR029; gene=nef

<400> 63

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agacaaaccc	ctccagcagc	agaaggggtg	ggagcagtg	ctcaagactt	agaaagacgg	120
ggggcaatta	caagcagcaa	tactggagct	aataatcctg	actttggcctg	gctggaggca	180
caagaggaag	aggaagtagg	ctttccagtc	agacctcagg	taccttttaag	accaatgact	240
tataagggag	ctcttgcctt	cagtcacttt	ttaaaagaaa	agggggggact	ggaaagggtta	300
atttattcca	agaaaagaca	agagatcctt	gatctgtggg	ttaccacac	acaaggctac	360
ttccctgatt	ggcagaacta	cacaccaggg	ccagggacca	gatatccact	gaccttaggg	420
tggtgcttta	agctagtacc	agttgaccca	gaggaggtag	aaaaggccaa	tgaaggagag	480
aacaactgct	tgctacaccc	catgagccaa	catggaatgg	aggtgaaga	cagagaaata	540
ctgcagtggg	ggtttgacag	ccgcctagca	tttcatcaca	tggcccagga	gctgcatcgg	600
gagtactaca	aggactctgc	a				621

<210> 64

<211> 1503

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY032.3; gene=gag

<400> 64

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ttaaggccag	ggggaaagaa	aaaatataga	ctgaaacatc	tagtatgggc	aagcagagag	120
ttggaaagat	tcgcacttaa	ccctggcctt	ttagaacacg	cagaaggatg	tcaacaatta	180
atgggaacat	tacaatcaac	tctaaaaca	ggatcagaag	aacttagatc	attatataat	240
actataacaa	ccctctgtgtg	cgtacatcaa	agaatagatg	tacaagacac	caaggaagct	300
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gaaaaggctt	tcagcccaga	agtaataacc	atgttctcag	cattatcaga	gggagccacc	540
ccacaagatt	tgaacatgat	gctaaatata	gtggggggac	accaggcagc	aatgcaaatg	600
ttaaaagata	ccatcaatga	ggaagctgca	gectgggaca	ggacacatcc	agtcacatga	660
gggcctattc	caccaggcca	gatgagagaa	ccaaggggaa	gtgatatagc	aggaactact	720

SEQ 67

agtacccttc	aagaacaat	aggatggatg	acaagcaacc	cacctgtccc	agtgggagaa	780
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agcatcttgg	acataagaca	aggacacaaa	gaacccttca	gagattatgt	agataggttc	900
ttttaaagtgc	tcagagcaga	acaagctacc	caggagggtga	aaaaatggat	gacagaaacc	960
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taa						1503

<210> 65

<211> 3009

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CT032.3; gene=pol

<400> 65

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gccagagcca	acagccccgc	ccgcggaatg	cttagagagg	aaagaggaga	caacctctct	120
tctgaagcag	gaaccgaggg	acaaggaact	atatccttta	acttccctca	aactactctt	180
tggcagcgac	cccttgtcac	aataaaaacta	gggggacaga	taaggggaggc	tcttttagat	240
acaggagcag	atgatacagt	attagaagaa	ataaatttgc	caggaaaagt	gaagccaaa	300
atgatagggg	gaatcggagg	ttttatcaaa	gtaagacaat	atgatcaagt	acctatagaa	360
atttgtggaa	aaaaggccat	aggcacagt	ttagtaggac	ctacacctgt	caacataatt	420
ggacgaaca	tgttgactca	gcttggttgt	actttaaatt	ttccaattag	tcctattgaa	480
actgtaccag	taaaattaaa	gccaggaatg	gatggcccaa	agggttaaaa	atggccattg	540
acagaagtaa	aaataaaaagc	cttaacagag	atatgtacag	acatggaaaa	ggagggcaag	600
atttcaaaaa	tggggcctga	aaatccatac	aatactccaa	tatttgctat	aaagaaaaaa	660
gacagcacta	aatggagaaa	attagtagat	ttcagagaa	tcaataaaa	aaactcaggac	720
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tacactgcat	tcaccatacc	tagtaccaac	aatgagacac	caggaaatag	atatcagta	900
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SEQ 68

f

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caggattcag	gatacagaag	aaacatagta	acagactcac	agtatgcaat	aggaatcatt	1980
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caagttagata	aattagtcag	caatggaaac	agaaaggtgc	tatttttaga	tggaaatagat	2160
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ggggcagtag	taatacagga	caacagtgat	atcaaatgag	taccaagaag	aaaagcaaa	2940
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gaagattag						3009

<210> 66

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CT032.3; gene=vif

<400> 66

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agacatcagt	atgaaagtag	gcacccaaaa	gtaagttcag	aagtacatat	cccactaggg	180
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ttgggtcatg	gagctcccat	agaatggagg	ctcagaagat	atagcacaca	agtggtacct	300
gacctggcag	accaactaat	tcatatgcat	tactttgatt	gtttttcaga	atctgcacata	360
aggaagacca	tattaggaca	tagagttagt	cctaggtgtg	aatatcaaac	aggacataat	420
aaggtaggat	ccttacaata	cctggcacta	gcagcattaa	tatccccaaa	aaagacaaag	480
ccacctttgc	ctagtgttaa	gaaactagt	gaggatagat	ggaacaagcc	ccagaagacc	540
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<210> 67

<211> 288

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY032.3; gene=vpr

<400> 67

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ggcctaggac	agcatatcta	taacacttat	ggagatacct	gggaaggggt	tgaagctata	180

SEQ 69

f

ataagaattt tgcaacaact actgtttatt catttcagaa ttgggtgccca acatagtaga 240  
ataggcatta ctctctaaa gagaaaggagg aggggatgga gccagtag 288

<210> 68

<211> 2643

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CT032.3; gene=tat

<400> 68

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SEQ 70

f

ggcagggata ctcacctttg tctttgcaga cccttatccc aacaacccaa cggggactcg 2580  
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<210> 69

<211> 2688

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CT032.3; gene=rev

<400> 69

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 atagtaggac tggtagtagc gctaattata gtaatagtag tgtggacttt agtatttata 180  
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<210> 70  
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<220>  
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<212> DNA  
<213> Human immunodeficiency virus type 1

<220>  
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gtacctgtgt ggagagacgc agagaccacc ctattttgtg catcagaagc taaagcatat 180  
gagaaagaag tacataatat ctgggctaca catgcctgtg taccacaga ccccaacca 240  
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SEQ 72

f



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 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> nef

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<210> 73  
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 <213> Human immunodeficiency virus type 1

<220>  
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SEQ 73

f

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<210> 74

<211> 3000

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=962M651.8; gene=pol

<400> 74

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SEQ 74

f

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<210> 75

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM651.8; gene=vif

<400> 75

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<210> 76

<211> 291

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM651.8; gene=vpr

SEQ 75

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<210> 77  
 <211> 2666  
 <212> DNA  
 <213> Human immunodeficiency virus type 1

<220>  
 <223> isolate=962M651.8; gene=tat

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f

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<210> 78

<211> 2684

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=962M651.8; gene=rev

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SEQ 77

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 <213> Human immunodeficiency virus type 1

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caaagaaaaa	tagactgggt aattaaaaga attagggaaa gaggcagaag cagtggcaat 180	
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cattgttaac	ttagtaggac taactggact aagactttac gagaggttaag gaacaataa 1080
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SEQ 78

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<211> 621

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> nef

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<210> 82

<211> 1496

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

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<210> 83
<211> 3017
<212> DNA
<213> Human immunodeficiency virus type 1

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<220>
<223> isolate=96AM751.3; gene=pol

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SEQ 82

f

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<210> 87

<211> 2631

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96ZM751.3; gene=rev

<400> 87

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<210> 88

<211> 261

<212> DNA

<213> Human immunodeficiency virus type 1

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<223> isolate=96AM751.3; gene=vpv

<400> 88

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<210> 89

<211> 2544

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96AM751.3; gene=env

<400> 89

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SEQ 84

f

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<210> 90

<211> 624

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=96AM751.3; gene=nef

<400> 90

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<210> 91

<211> 1491

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=gag

<400> 91

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<210> 92

<211> 3012

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=pol

<400> 92

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SEQ 86

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<210> 93

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=vif

<400> 93

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aaacatacct	atgaagcag	aaatccaaga	ataagttcag	aagtacacat	cccgtagagg	180
gaggctagaa	taattagtaag	aacatattgg	ggtctgcaca	taggagaaaa	agactggcac	240
ttgggtcatg	gagttctcat	agaattggagg	caaaacaggt	atcatacaca	aatagacct	300
gatctggcag	accatcta	ccatctgtat	tattttgact	gtttttcoaga	atctgccata	360

SEQ 87

aggaagccca taataggaga aatagttagt cctaggtgtg aatatcaagc aggcataac 420  
aaggtagggt ctctgcaata ttgtgcattg aaagcagtag tagcttcaac aaggcacaag 480  
ccacctttgc ctagtgttag gaaattagta gaggatagat ggaacaagcc ccagaagacc 540  
aagggccaca gaggggccca tacaatgaat ggatgttag 579

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<213> Human immunodeficiency virus type 1

<220>  
<223> isolate=94CY017.41; gene=vpr

<400> 94  
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ataagatatt tgcaacaact actgtttgtc catttcagaa ttgggtgcca acatagcagg 240  
ataggcatta ttcaagaag aagagtaagg gatggagcca gtgacccta a 291

<210> 95  
<211> 2655  
<212> DNA  
<213> Human immunodeficiency virus type 1

<220>  
<223> isolate=94CY017.41; gene=tat

<400> 95  
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f



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cagagggtcc	gcacaggccc	agaggaaccc	aagaaggagg	tggagagcaa	ggcagagaca	2640
gatcgattcg	attag					2655

<210> 96

<211> 2721

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=rev

<400> 96

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gtgggtcaca	gtatactatg	gagtagctgt	gtggaaagat	gcagatacca	tcctattttg	420
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SEQ 89

f

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<210> 97

<211> 246

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=vpu

<400> 97

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tggttaata	caaaagataag	tgagagagca	gaagacagtg	gcaatgagag	tgatggggac	180
acagagggaa	tatcagcact	tgtggagagg	gggcactctg	attttgggga	tgtaataat	240
gtgtaa						246

<210> 98

<211> 2598

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=env

<400> 98

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cctgtgtgga	aagatgcaga	taccatccta	ttttgtgcat	cagatgtctaa	agcatatgat	180
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gaaataaacc	tggaataatg	aaacagaaaa	tttaatatgt	ggaataataa	catggtagag	300
cagatgcaag	aagatataat	cagcttatgg	gtcctaaagcc	taagcccatg	tgtaaaatta	360
accccgctct	gcgtcatctt	aaattgtagc	aatgccataa	ccagcaccca	tagcaatagc	420

SEQ 90

f

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<210> 99

<211> 654

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94CY017.41; gene=nef

<400> 99

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SEQ 91

f

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caacatggag tagatgaccc tgaaagagaa gtgttaagat gggagtttga tagaagccgtg 600  
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<210> 100  
<211> 1476  
<212> DNA  
<213> Human immunodeficiency virus type 1

<220>  
<223> isolate=94IN476.104; gene=gag

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ctggaaagat ttgcgcttaa ccctggcctt tttagagagt cagacggagt taacaaata 180  
ataaacacag tcatccagc tcttaagaca ggaacagagg aacttaggtc attattcaac 240  
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<210> 101  
<211> 3011  
<212> DNA  
<213> Human immunodeficiency virus type 1

<220>  
<223> isolate=94IN476.104; gene=pol

<400> 101  
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cccttggtct caataaaagt agggggccag ataaaaggaa ctctcttaga cacaggagca 240  
gatgatacag tattagaaga aatagctttg ccaggagat ggaaaccaa aatgatagga 300

SEQ 92

f

ggaattggag	gttttatcaa	agtaagacag	tatgatcaaa	tacttataga	aatttgtgga	360
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<210> 102

<211> 579

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=vif

SEQ 93

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 agacatcatt atgaaagcag acatccaaaa gtaagtgcag aagtacacat cccatttagga 180  
 gatgctagat tagtaataaaa aacatattgg ggtttcaaaa caggagaaaag agattggcat 240  
 ttgggtcatg gcgtctccat agaattggaga ttgggaagat atagcacaca agtagaacct 300  
 ggctctggcag accagctaat ccatatgcat tattttgatt gttttgcaga ctctgccata 360  
 agaaaagcca tatttaggaca catagtattt tctaggtgtg attatcaaac aggcataaat 420  
 aaggttaggt ctctacaata cttggcactg acagcattga taaaaccaa aaagagaaag 480  
 ccacctctgc ctagtgttaa gaaattagta gaggatagat ggaacaatcc ccagaagacc 540  
 agggaccaca gagggaacca tacaatgaat ggacactag 579

<210> 103

<211> 291

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=vpr

<400> 103

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 agcttaggac aatatatcta tgaacacat ggggatgctt ggacaggagt cgaagcttta 180  
 atagaacac tgcaacaatt actgtttatt catttcagaa ttgggtgccca gcatagcaga 240  
 ataggcattt tacaacggag aagagcaaga aatggagcca gtatgcctca a 291

<210> 104

<211> 2633

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=tat

<400> 104

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 aaaggcttag gcatttccta tggcagggaag aagcggagac agcgcagcag cgctcctcca 180  
 agcagtgaag atcatcaaaa tcttatatca aagcagtaag tatatgtaat ggtgaattta 240  
 ttagaagag tagattatag attaggagta ggagcattaa tagtagcatt aatcttagca 300  
 ataattgtgt ggaccatagc atattctagaa tataggaaat tgttaagaca aagaaaaata 360  
 aacaggttaa ttgaaagaat tagggaaaga gtagaagaca gtggcaatga gagtgagggg 420  
 gatactgagg aattgtcaac actggtggat atggggaatc tttagctttt ggatgctaat 480  
 gattttataa gtatagggga acttgtgggt cacagtctat tatggggatc ctgtgtggaa 540  
 agaagcaaaa actactttat tctgtgcac agatgcataa gcttatgaga aggaggtgca 600  
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 agtaaatgta acagaaaatt ttaacatgtg gaaaaatgac atggtggatc agatgcata 720  
 ggtactaact agttttatgg atcaagcct aaagccatgt taaagtga cccactctg 780  
 tgtacttta aactgtagta aggttaccaa taatgctact gcaataata ctgatgatat 840  
 aaaaaattgc tcttttaagt caaccacaga aataagagac aagaacgca aagagtatgc 900  
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 tagtgagtac atattaataa attgtaatac ctcaaccata acacaagcct gtccaaaggt 1020

SEQ 94

f

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aattgtaaca	catagcttta	attgtggagg	agaattcttt	tattgttaata	catcaagact	1560
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cttgataggt	ttgagaataa	tttttgcgtg	gctactctata	gtcaaatagag	ttaggcagg	2520
atactacct	ttgtcgttgc	agacccttac	cccagaccgg	agggaaacccg	acaggctcag	2580
aggaatcgaa	gaagaaggtg	gagagcaaga	caaaagacaga	tcatttcgat	tag	2633

<210> 105

<211> 2651

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=rev

<400> 105

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gattaggagt	aggagcatta	atagtagcat	taatcttagc	aataatttgg	tgaccatag	180
catatctaga	atataggaaa	ttgttaagac	aaagaaaaat	aaacaggtta	attgaaagaa	240
ttagggaaag	agtagaagac	agtggcaatg	agagtggagg	ggatactgag	gaattgtcaa	300
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aacttgtggg	tcacagttcta	ttatggggta	ctgtgtgga	aagaagcaaa	aactacttta	420
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gatcaaaagc	ttaaagccatg	tgtaaaagtg	acccactct	gtgtcaactt	aaactgtagt	660
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SEQ 95

f

gtatcaactc	aactactgtt	aaatggtagc	acagcagaaa	aagagataat	aactagatct	1080
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gcagcgagag	cgggtgaact	tctgggacgc	agcagctca	ggggactaca	gaggggtgtg	2640
gaagccctta	a					2651

<210> 106

<211> 261

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=vpu

<400> 106

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caaagaaaaa	taaacagggt	aattgaaaga	attagggaaa	gagtagaaga	cagtggcaat	180
gagagtgagg	gggatactga	ggaattgtca	acactggttg	atatggggaa	tcttaggctt	240
ttgtagtcta	atgatttata	a				261

<210> 107

<211> 2574

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=env

<400> 107

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SEQ 96

f



ttttggatgc	taatgattta	taatgtagta	gggaacttgt	gggtcacagt	ctattattggg	120
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gagaaggagg	tgcataatat	ctggggctaca	catgccctgtg	taccacagaa	ccccaaccca	240
caagagatgg	atttagttaa	tgtaacagaaa	aatttttaaca	tgtggaaaaa	tgacatgggtg	300
gatcagatgc	atgaggatgt	aatcagttta	tgggatcaaa	gcctaaagcc	atgtgtataag	360
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acctggatgc	agtggtgata	agagattagt	aattacacaa	acacaatata	ccggttgctt	1920
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caaaattctgt	ggaattgtgt	tagcataaca	aaatggctgt	ggtatataaa	aatatttcata	2040
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ataacaatag	ctgagggaag	agataggatt	atagaattta	cacaaagaat	ttgcagagct	2520
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<210> 108

<211> 624

<212> DNA

<213> Human immunodeficiency virus type 1

<220>

<223> isolate=94IN476.104; gene=nef

<400> 108

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SEQ 97

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ggagcactta caaccagcaa cacaccaagc aataatgctg ctgggtgcctg gctgcaagcg 180
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ttaatttact ctaagaaaaa gcatgaaatc cttgatttat ggggtttataa cacacaaggc 360
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gaaacaact gtttgctaca cccatgagc caacatggaa tggatgatga agatggagaa 540
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ccggagtatt acaagactg ctga 624

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<210> 109
<211> 17
<212> DNA
<213> artificial sequence

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<220>
<223> Upstream primer UP1A spanning tRNA primer binding state

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```

<400> 109
agtggcgccc gaacagg 17

```

```

<210> 110
<211> 22
<212> DNA
<213> artificial sequence

```

```

<220>
<223> Downstream primer Low2 spanning the R/U5 junction in the
3' long terminal repeat

```

```

<400> 110
tgaggcttaa gcagtgggtt tc 22

```

```

<210> 111
<211> 28
<212> DNA
<213> artificial sequence

```

```

<220>
<223> Upstream UP1AMlul primer containing Mlul restriction site

```

```

<400> 111
tctctacgcg tggcgccga acagggac 28

```

```

<210> 112
<211> 35
<212> DNA
<213> artificial sequence

```

```

<220>
<223> Downstream Low1Mlul primer containing Mlul restriction site

```

```

<400> 112
accagacgcg tacaacagac gggcacacac tactt 35

```

SEQ '98